

Final Report  
on State Energy Program (SEP) Special Project  
Multi-tiered Alternative Transportation Fuel Outreach Program  
October 1997 - June 2003

Submitted by the State of Hawaii  
Under USDOE Contract Number  
DE-FG51-97R020881

September, 2003

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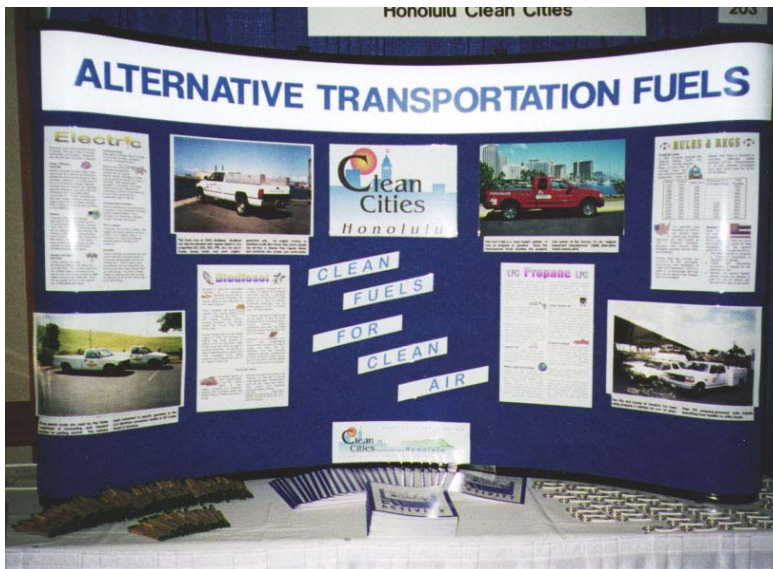
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## EXECUTIVE SUMMARY

This is the final report on the State Energy Program (SEP) Special Project under the United States Department of Energy (USDOE) Contract Number DE-FG51-97R020881, entitled “Multi-tiered Alternative Transportation Fuel Outreach Program,” which ran from October 1, 1997 through June 30, 2003.

The project involved outreach programs intended to recruit new, non-traditional stakeholders and to accelerate alternative fuel acceptance and use in municipal and private vehicle fleets in Hawaii.



*In addition to using “traditional” displays and exhibits to reach “non-traditional” audiences (for example, at auto shows and school fairs), the project also developed an activity book for children and used attention-getting vehicles to reach a larger audience.*

The project had four objectives:

1. Joining other organizations in the sponsorship of Hawaii’s Electron Marathon;
2. Publishing an alternative fuel activity book for elementary school students;
3. Producing displays that appeal to non-traditional stakeholder candidates; and,
4. Participating in exhibitions, trade shows, conferences, seminars, parades, and other events



## BACKGROUND: HONOLULU CLEAN CITIES



The Honolulu Clean Cities coalition, the 38th Clean City designated by the USDOE, participates in numerous public awareness events, including conventions, outdoor fairs, indoor exhibits, and ride-and-drive opportunities; distributes

thousands of pamphlets, brochures, and fact sheets on alternative fuels; develops, prints, and distributes a multiple-page newsletter focusing on alternative fuels projects in Hawaii to a distribution list of hundreds of fleet managers, decisionmakers, and alternative fuels supporters; and continues to develop new partnerships and to add stakeholders to the coalition.

The state's economy relies heavily on tourism, which is largely dependent upon an attractive and appealing environment, including clean air and water. The state is also isolated from sources of fossil fuels, and the economy has been



sluggish for the past several years. These facts underscore the importance of environmental responsibility, energy efficiency and independence, and economically viable alternatives.

Despite the potential of alternative fuels to provide benefits for the local environment, economy and lifestyle, however, there remains great reluctance on the part of the public and many fleet managers to utilize ATF.

Mandates alone may not prove effective in converting fleets to ATF use; voluntary compliance and voluntary ATF use have a much greater potential to be cost-effective for both the enforcing agency and covered (as well as non-covered) fleets. This project provided a multi-tiered approach to positively influence public perception and acceptance of ATF.

## GOALS AND OBJECTIVES OF PROJECT

This project was intended to accelerate the understanding, use and general acceptance of alternative transportation fuels (ATF) by fleet managers and others affected by the alternative fuel transportation program of the Energy Policy Act of 1992, as well as by regulators, decision-makers, teachers, students, and the general public. The four main objectives were:

## Co-sponsorship and support of the Hawaii “Electron Marathon”

The Hawaii Electron Marathon has been held annually since 1996. The marathon, coordinated by Hawaiian Electric Company and sponsored by numerous public and private-sector partners, including the Hawaii State Department of Education, serves to integrate math, science,



language arts, electronics, and automotive curricula with technical, “hands-on” skills as each team designs, builds and documents all aspects of an electric vehicle. Each team must also make a five (5) minute presentation as well as submit the vehicle for “pre-race” technical inspection and judging.

Vehicles are judged on appearance, aerodynamics, safety, and overall use of recycled materials. The final evaluation criterion is the vehicle’s ability to maintain a steady state 25 MPH road speed and the total distance traveled in 60 minutes on a single charge.

In addition to the applied learning aspect of the marathon, the overall goal of the marathon is to: increase students’ and teachers’ knowledge and understanding of electric vehicles; provide a wide variety of individuals and groups with the opportunity to become familiar and comfortable with electric vehicles; and foster teamwork, respect and an appreciation for planning, design and construction technologies.

Support of this “training ground” for future ATF/AFV engineers and entrepreneurs ensures its growth to accommodate the increasing interest in ATF and AFV, and reinforces the message to the general public that ATF and AFV are not a passing “fad” but are important to our future, and are here to stay.

Honolulu Clean Cities supported the Electron Marathon through providing funding for the event as well as providing staff support as race officials and judges.

## Drafting, publication and distribution of ATF/AFV activity books

To foster acceptance and understanding of ATF within the community, awareness programs for non-traditional organizations are needed. These non-traditional organizations are potentially new stakeholders and their inclusion provides



additional /breadth and depth to the ATF/AFV message.

Educational institutions are the most prominent of potential, non-traditional stakeholders. ATF/AFV outreach programs for educational institutions provide teachers and students with information on actual solutions to many global problems. In addition, they raise awareness of ATF/AFV that are becoming more common place and will likely become an integral factor in their lives.

Also, since today's students are tomorrow's leaders, decision-makers, scholars and fleet operators, effective outreach programs at an early stage will ultimately improve the acceptance and use of ATF/AFV as the students enter the job market and assume key roles in vehicle, fuel, and policy areas.



The coalition's outreach program included the publication and distribution of an ATF/AFV activity book for elementary schools. The *Fun-Fueled Activity Book* includes a number of fun activities such as coloring, dot-to-dot drawings, word hunts, mazes, etc., that are ATF/AFV oriented; an appendix containing in-depth fact sheets on each of the alternative fuels; and contact information for local alternative fuel experts and national information resources, including U.S. Department of Energy websites and the alternative fuel information hotline.

### **Exhibits and displays for conferences, trade shows, seminars, and other public events**

The coalition's awareness and information programs to date have resulted in several invitations to participate in exhibitions, fairs, and conferences.

Most of these events are geared towards children and other non-automotive oriented individuals. Although these participants do not directly affect ATF/AFV decisions for vehicle fleets, they play a key role in influencing overall public acceptance of alternative fuels and desire for the benefits offered by alternative fuels, such as energy security, clean air, and jobs. However, much of the alternative fuel material that exists is geared towards fleet operators and is inappropriate or too technical for the general public.



The process of informing and educating the community on ATF/AFV issues begins with the creation of simple, non-technical graphic displays and promotional items. Graphic display items must convey the essential points of need for ATF/AFV without too much extraneous detail. Promotional items such as pens, pencils, key rings, or area maps with ATF refueling stations provide for instant recognition of the coalition and reminders of the ATF/AFV message.

Also essential to public awareness is providing a distinctive appearance for the alternative fueled vehicles. Without eye-catching signage, many members of the public may come in contact with ATF/AFV daily and not realize it.

The coalition therefore developed AFV signage to more dynamically identify ATF use with attractive graphics and colors. In addition, the coalition supported a stakeholder's plan to purchase a vehicle and equip it with appropriate graphics for use in parades, shows, exhibitions, conferences and seminars.



### Participating in exhibitions, trade shows, conferences, and other events.



The “traditional” events in which alternative fuels are featured are those events which pertain to energy, transportation, or the environment. These audiences tend to have at least some background in technical and policy aspects of alternative fuels and vehicles, and have been exposed to the available fuels and vehicles to various degrees. It is important that these groups be kept informed of progress

in the area of alternative fuels and vehicles, and that they be given a chance to network with each other and experts in the field.

However, to build broader public acceptance and interest in the value and potential for alternative fuels, it is important that information on alternative fuels also be presented at “non-traditional” events. Examples of such events are school fairs, new product shows, in libraries and shopping centers, at truck races, in parades, etc.



One example of an event which reaches non-traditional audiences is the annual “Honolulu City Lights” Christmas Parade, which is well-attended (generally between 30,000 and 50,000 residents and tourists) as well as telecast live. Following the parade, interested members of the public (see photo at right) come to get a



closer look at the vehicles and are given an opportunity to ask questions. This is an excellent opportunity to introduce alternative fuels and alternative fueled vehicles to members of the public who would not otherwise be exposed to the concept.

## PROJECT PARTICIPANTS



Clean Cities Stakeholders, listed below, were active participants in the project:

- American Lung Association of Hawaii
- American Public Works Association - Hawaii
- Ameron HC&D
- Board of Water Supply (Honolulu)
- Brewer Environmental Industries
- City & County of Honolulu
- Commercial Training Consultants
- Cummins Hawaii Diesel Power
- Del Monte Fresh Produce
- EA Engineering, Science, and Technology
- Electric Vehicle Association of Hawaii
- Engineers Surveyors Hawaii, Inc.
- Enova Systems (formerly U.S. Electricar)
- Fleet Street Graphics
- The Gas Company
- GEM of Hawaii
- HT&T Truck Center
- Hawaii Detroit Diesel Allison
- Hawaii Electric Vehicle Demonstration Project
- Hawaii Natural Energy Institute
- Hawaii Transportation Association
- Hawaiian Electric Company, Inc.
- Oahu Fleet Safety Organization
- Pacific Biodiesel
- Pacific International Center for High Technology Research
- Pacific Machinery
- State of Hawaii Department of Business, Economic Development & Tourism
- Travel Plaza Transportation
- US Department of Energy (USDOE) Pacific Liaison
- US General Services Administration (USGSA), Fleet Management Branch
- US Navy, Public Works Center



# RESULTS

The project met or exceeded all of its revised objectives. Partial results from the first task of the original scope are included below.

## Introduced private fleets to propane fuel.

The original project scope included a task to identify private fleets for conversion to liquified petroleum gas (commonly referred to as “propane”), which was the only available alternative fuel at the time of the proposal. Fleet managers and other decision-makers within potential fleets were offered the opportunity to operate a propane truck for a specified period of time, and surveyed on their impressions. The original project proposed that the fleet managers then be encouraged to participate in the conversion of one of their own vehicles to operate on propane for at least one year, with the cost of the conversion to be partially offset by project funds and partially offset by in-kind contributions from the propane conversion company. However, this effort was cut short due to changes in Hawaii’s fuels market, changes in certification requirements by the Environmental Protection Agency, and changes in vehicle availability from original equipment manufacturers; the allocated project funds for this effort were re-directed to public outreach and education activities.

The seventeen completed surveys are included as an appendix to this report. Some questions were not answered by respondents, so not all questions have the same total number of responses. Survey questions and results were:

Legend:				
-- much worse compared to the same type of vehicle fueled with gasoline	- slightly worse compared to the same type of vehicle fueled with gasoline	= roughly the same compared to the same type of vehicle fueled with gasoline	+	++ much better compared to the same type of vehicle fueled with gasoline

	--	-	=	+	++
Range of this vehicle:		9	7		
Acceleration of this vehicle:		7	10		
Braking of this vehicle:			17		
Maneuverability of this vehicle:		1	16		
Overall handling of this vehicle:			16		
Cargo capacity of this vehicle:	1	12	2		

Ease of operation:		1	15		
Overall opinion:		4	12	1	
Would you consider buying a vehicle of the same make with the same engine and fuel system?	Yes: 12				No: 3
Comments: <ul style="list-style-type: none"> <li>• Was very impressed with overall performance. Good acceleration both from standstill and moving positions. Did not feel any difference switching between fuels. (Stafford Kiguchi, The Gas Company)</li> <li>• Very impressive AF vehicle. Thanks. (Jim Yates, The Gas Company)</li> <li>• Propane wasn't running properly. Used mostly gasoline. (Kyle Nakamura, Island Movers)</li> <li>• (At this point, vehicle was taken in for service.)</li> <li>• Worked great on both fuels. Went up Pali very well on both LP &amp; gas – no difference. Nice truck! (Dave Soderlund, Travel Plaza Transportation)</li> <li>• No appreciable difference in fuel used! Vehicle is "transparent" in terms of fuel type &amp; operator's need to "adjust" to different fuels. This vehicle can readily be marketed to private ownership by non-commercial users in areas with adequate refueling infrastructure. Recommend high profile advertising of the availability of this vehicle! (Ross Sasamura, City and County of Honolulu)</li> <li>• Vehicle driven on propane runs little more smooth. Vehicle driven on gas has slightly more power. Vehicle on propane had little over 10 miles per gallon. This vehicle runs well on both fuel systems &amp; is a very good truck. (Brian Nomura, Grace Pacific Corp.)</li> <li>• Smooth running &amp; quiet. Propane power was impressive. Propane tank takes up some bed space. Ford tough! (Verne Santos, B and C Trucking Company)</li> <li>• Propane tank needs to be out of the bed. Otherwise the difference in operation LPG/gas is minor. Here in Hawaii it will take some time to have LPG readily available. Nice truck. Thanks for the opportunity to participate. (Dennis Washburn, Eagle Fleet Services)</li> <li>• Engine runs very smooth on propane hot or cold. Fuel tank in bed takes up too much space. At this time cost of fuel to operate is too high (10 mpg on propane vs. 15.8 mpg on gas @ \$0.20/gal less) engine purrs at higher rpm but is really limited by poor gearing in trans. Very nice truck, a real head turner everywhere I went! If this truck could be more fuel efficient on propane, I would definitely have a propane truck of my own. (Dan Kinoshita, Honolulu Transfer and Storage)</li> <li>• Over-all performance of vehicle on LP is less than gas. Hesitation on acceleration on LP. Constant upshift does shift on hilly operation on LP. Rough idle on LP. Bed too small w/tank in bed. Set-up would be OK as a work truck bed but for those who like driving trucks – I don't think so. Where does one refuel with propane in Hawaii? (Steve Piper, Punahou School)</li> <li>• Overall performance with propane is acceptable. I did not have the opportunity to push it, i.e. accelerate from zero to 60 on an open highway. The acceleration using propane was slightly less efficient on a cold engine than using gasoline. However, with a warm engine, I did not detect any difference. My driving was 80% city and 20% highway, and noticed worse mileage per gallon with the propane. I used 0.75 of the propane tank and logged 203.1 miles. After 100 miles on gasoline, my gauge indicated I used roughly 0.25 of a full tank. I would suggest a small gasoline tank as a reserve, so the propane tank in the bed of the demo vehicle could be sized down or incorporated elsewhere. Taking up bed space would not appeal to any truck user, unless you raised the entire bed. Cruising and passing were identical using either fuel. The manufacturers together with any taxing authorities should partner in creating incentives for propane dispensing firms at the wholesale and retail level. (Brian Lau, First Hawaiian Leasing)</li> <li>• I was pleasantly surprised at the good performance. Engine size &amp; gearing provided</li> </ul>					

satisfactory power, even in off-road conditions. Fuel tank position reduced cargo space. Auto shut-off valve feature made re-fueling simple, but position of bleeder valve was inconvenient. Overall very positive experience. Access to propane for the average consumer would be a difficulty. (Brian Nishida, Del Monte)

- Slight hesitation when accelerating. Obviously cargo space is less due to propane tank. Overall, performance was great! (Naalei Keaunui, Unisyn)
- Enjoyed driving this truck. Cargo area too small for our needs. Cost of propane a little to high. Thank you for letting us use the truck and participate. (Ben Post, E Noa Tours)
- Hesitation during acceleration from the idle position. Possible adjustment fine tuning needed. I noticed it took longer to start the vehicle with the propane compared to gas, especially during cold starts. Overall the vehicle ran fine and no differences between the 2 different types of fuel were noted. I especially like the long range of miles between fill-ups! (excellent truck). (Eric Enjada, HT&T Trucking)
- I really enjoyed the fact of being friendly to the environment with the fuel choice. The propane had a hesitation at starting off. Over all the truck performed well. The best part of my experience was the “PR” to raise the awareness of taking care of our planet. Thanks! (Jesse Halsoy, Schuler Homes Inc.)

Although the conversion of vehicles to LPG under this project was terminated, fleet managers continued to express interest in following developments in the area of alternative fuels.

A periodic “Clean Cities Newsletter” (shown at right), outlining progress at the local and national level, is sent to fleet managers. Also, workshops on issues of interest to fleet managers are scheduled as topics of interest occur.

The newsletters are also available on the Clean Cities website, <http://www.hawaii.gov/dbedt/ert/cc/>.



## Supported Electron Marathons



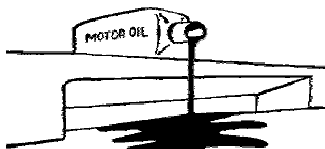
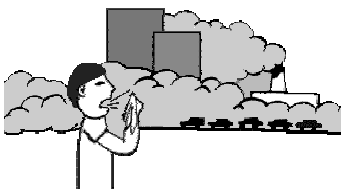
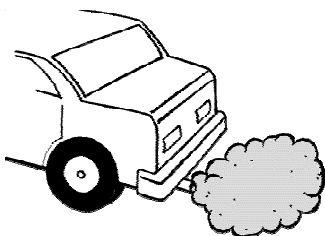
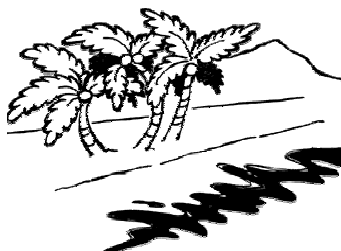
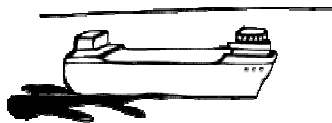
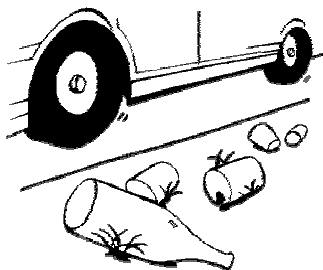
Members of Honolulu Clean Cities served as course marshals and official timers for the electron marathon events in 1997, 1998, 1999, 2000, 2001, and 2002.

Hawaiian Electric Company (HECO) provided, to each school, a motor kit valued at \$850 and a cash grant of \$750 to purchase additional supplies and parts; HECO also covered the overhead costs of the program and final event, for a cost share in excess of \$30,000 per year.

School participation was: 1998 – 27 teams; 1999 – 28 teams; 2000 – 21 teams; 2001 – 20 teams; 2002 – 24 teams. More information on the program is available from the HECO website, <http://www.heco.com/>.







A very “professional,” but fun, look was sought for the activity book. Original art was commissioned in cases where commercially available “clip art” was not available or did not provide a consistent look and feel within the activity.

An example of original artwork, used in a “cause and effect” match-up activity in the pollution section, is shown at left.

Topics are listed below.

## TOPICS:

### Transportation

Coloring ... Connect-the-Dots ... Maze ... Matching ... Scramble ... Crossword ... Word Search ... Math Teaser

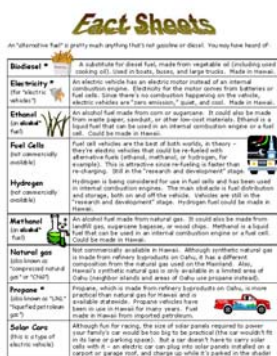
### Pollution

Cause-and-Effect ... Fill in the words ... Extra Tricky Quiz ... Math Teaser

### Clean Fuels

Matching ... Fill-in-the-Blanks ... True or False ... Find the Phrase ... Word Search ... Crossword ... Maze ... Summary

## FACT SHEETS:

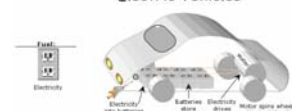


- Alcohol Fuels (Ethanol, Methanol)
- Biodiesel
- Electric Vehicles
- Electricity
- Fuel Cells
- Propane (LPG)
- Vehicles (Internal combustion, Electric, Fuel cell)

### Internal Combustion Engine Vehicles



### Electric Vehicles



### Fuel Cell Vehicles

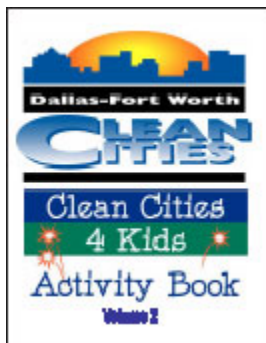


A “reference” section was included at the end of the activity book. Fact sheets for each of the fuels were developed, with sections entitled “What is it;” “Why \_\_ Fuel;” and “Did you know.” Finally, contact information was provided for both local experts and national experts (such as the alternative fuels data center and the alternative fuels hotline).

The activity book had two printings: the first run was of 1000 copies and the second was of 5000 copies. Activity books are distributed directly to schools, at “summer fun” and after-school activity centers, through energy offices and coalition partners, and at public awareness events.

The Activity Book is available electronically on the Honolulu Clean Cities website.

<http://www.state.hi.us/dbedt/ert/activitybook/>. The original files are available for use and editing by other Clean Cities coalitions, teachers, students, and others with an interest in the subject matter. Several requests for permission to use and modify the material have been received. The download page states: “Original files for use or modification for educational purposes only. Not to be commercially sold.”



The Clean Cities Coalition of Dallas-Fort Worth is just one example of others appreciating and making use of the activities and fact sheets.

Files are provided on the Honolulu Clean Cities website in a format which lends itself to modification by other coalitions, as well as teachers and energy office personnel. It allows users to add locally-relevant information, such as fueling site locations, Clean Cities participants, any local laws or ordinances of interest, etc.

For example, the Honolulu version of the Activity book has very little information on natural gas, since LNG and CNG fuels are not available. In the Dallas-Fort Worth example, information on natural gas, the reasons for local interest in and support of that fuel, and contact information, was added.

Websites that link to the Activity Book pages on Honolulu Clean Cities’ Website include:

- **CyberSleuth-Kids.Com**

<http://cybersleuth-kids.com/sleuth/Science/Transportation/>

“Welcome to CyberSleuth-Kids.Com, an online search engine and guide for the K-12 student... Only sites that meet our standards are submitted into the database. Our goal is not to have the largest database of web sites. Quite the contrary, the goal is to have an exclusive and educationally valuable web site.”

- **US Fuel Cell Council**

<http://www.usfcc.com/library.htm>

“Excellent resources for teachers, students, and professionals. The US Fuel Cell Council has assembled a collection of Books, Articles, and Reports that discuss fuel cells and fuel cell related issues.”

- **Wisconsin K-12 Energy Education Program, Winter 2000 newsletter**

[http://www.uwsp.edu/cnr/wcee/keep/acrobat/Winter\\_2000\\_Vol.2\\_No1.pdf](http://www.uwsp.edu/cnr/wcee/keep/acrobat/Winter_2000_Vol.2_No1.pdf)

“Hawaii’s Fun Fueled Activity Book ... information sheets on fuels, vehicles, pollution, and energy technologies. Great for elementary students.”

- **Fuel Cells 2000's Fuel Cell Library**

<http://216.51.18.233/biblio.htm>

“created by Honolulu Clean Cities to provide accurate, reliable information on ‘alternative fuels’ in a fun and interesting way.”

- **Tennessee Energy Education Network**

[http://www.state.tn.us/ecd/pdf/energy/energy\\_materials.pdf](http://www.state.tn.us/ecd/pdf/energy/energy_materials.pdf)

- **Multnomah County Library Homework Center**

<http://www.multcolib.org/homework/trans.html>

“This site from Hawaiian State Energy, Resources and Technology Division provides upper elementary and middle school youth with basic facts about alternative fueled vehicles and fun activities to learn more about them”

- **Advanced Vehicle Technology Institute**

[http://www.etvi.org/General/New\\_links.html](http://www.etvi.org/General/New_links.html)

“is pleased to provide you with some of our favorite electric vehicle links”

- **North East Sustainable Energy Association**

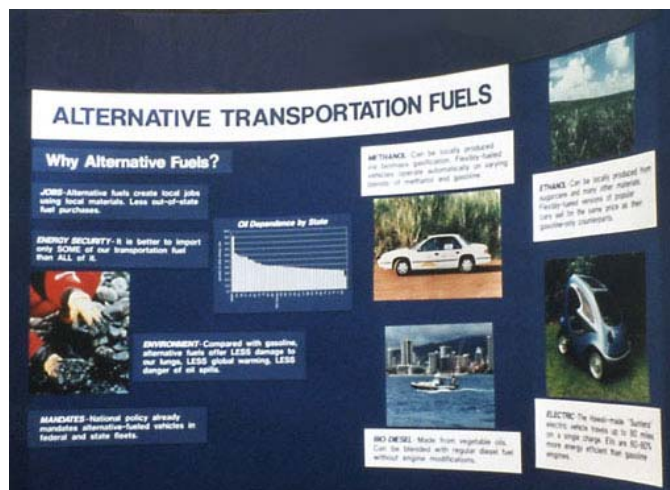
<http://www.nesea.org/greencarclub/links/info.html>

“The activities are appropriate for grades 3-6, the fact sheets are appropriate for grades 7-12. From the State of Hawaii”

## Produced displays that appeal to non-traditional stakeholder candidates

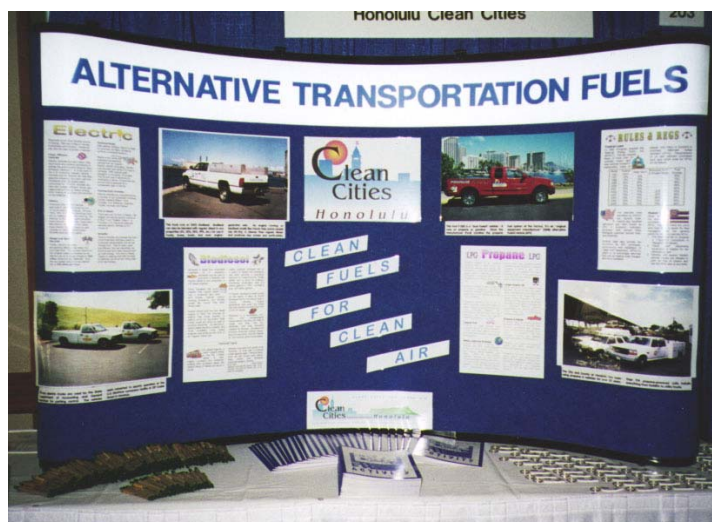
Four portable tabletop display units were purchased. Signage was developed to show alternative fuels and vehicles in use in Hawaii, as well as to describe the importance of alternative fuels. Using re-positionable graphics, the content is changed to match the interest of the expected audience.

For large exhibitions, where people are far from the display, text and graphics are large and simple.



For smaller areas where attendees can take their time to read and browse, more information can be provided. The display shown at right was at the Mayor's Asia-Pacific Environmental Summit.

Promotional items were used to attract people to the exhibits and to provide them with a tangible, take-away reminder of alternative fuels. Key rings, pencils, and pens were designed, ordered, and distributed.



The Honolulu Clean Cities coalition developed the slogan "Clean Fuels for Clean Air" to describe the connection between the name (Clean Cities) and the topic (alternative fuels). This slogan is used on displays,

promotional items, and the Clean Cities letterhead.

The pens are particularly well-suited to be distributed with the activity books.

Exhibit attendees of all ages have been seen taking a break, using the pen to do activities in the book..



In addition to indoor displays, outdoor displays and venues were targeted. Vehicles on display tend to be naturally attention-getting.

A bright red truck, with "Honolulu Clean Cities" graphics and "clean fuels for clean air" (shown at right, in the City Lights parade) was developed for this purpose and has been an extremely effective display unit. In the picture at right, a replica of the Aloha Tower is in the bed of the truck. Since the venue was a Christmas parade, a toy train and Christmas scene surround the base of the tower. This truck was also used in the propane demonstrations described earlier.



Another means of drawing attention to the alternative fueled vehicles which are in everyday use on Hawaii's roads is through the use of colorful bumper stickers and decals. Electric-, biodiesel-, and propane- specific decals were designed, ordered, and applied to vehicles. The remaining decals will be provided to owners of alternative fuel vehicles upon request.

*Electric Powered!*  
For a Cleaner and Greener Hawaii



In the photo at left, the “Electric Powered” decal can be seen on the side of the truck.

Also, fuel-neutral “clean fuels for clean air” bumper stickers and “clean fuel vehicle” decals were designed, ordered, and applied; they are versatile, as they can be used on any alternative fuel vehicle.



**Participated in exhibitions, trade shows, conferences, seminars, parades, and other events.**

Clean Cities stakeholders participated in more than twenty events over the project period, including “Kids day” exhibits at shopping centers, an environmental symposium in conjunction with the Hawaii State Science and Engineering Fair, an auto show, three transportation association conventions, a meeting of the Hawaii Automotive Repair and Gasoline Dealers Association, several health and wellness fairs, and other events.



This electric truck was used as the pace vehicle for the Johnny Faerber Men's 10k Run in Honolulu, May 9, 1999. The front-of-the pack runners certainly appreciated a vehicle that didn't put out pollutants, since they're following right behind. (A lungful of vehicle exhaust doesn't help their performance or their health.) Some of the runners were so impressed, they said, "Electric vehicles should be used as pace vehicles in all races!" This

photo was taken just before the race started. Shown are Howard Wiig (standing), who drove; and (seated on the toolbox) Mike Tymm, sports writer.

One annual event which has become a tradition for Honolulu Clean Cities coalition is the annual Honolulu City Lights parade. Each year, Clean Cities decorates a variety of alternative fuels vehicles – ranging from GEM neighborhood electric vehicles to alcohol-fueled vehicles, propane vehicles, electric buses, and even manufacturers’ demonstration electric vehicles.



The photo at left shows one of the City and County of Honolulu’s propane-powered tow trucks which participates with Clean Cities in Honolulu’s annual Electric Light Christmas Parade.

The photo at right shows the original “Clean Cities” sign used with the electric bus. More recently, a backlit sign with the “Honolulu Clean Cities” logo has been developed. The new sign is more durable and can be used for daytime as well as nighttime events.



The photos at right show Clean Cities at the annual “health and wellness” fair put on by Momilani Elementary School.



Community outreach events, such as the Earth Day event shown at left and in the photos below, provide an opportunity for Clean Cities stakeholders to

demonstrate alternative fuels and vehicles and network with other exhibitors, in addition to informing the public.

Vehicles are naturally attention-getting, whether on display indoors or outdoors. Colorful decals attract attention, provide information on the type of fuel, and give the message:

“clean fuels for clean air.”



Alternative fuel vehicles are on the left; “Classic Cars” are on the right.

In addition to exhibits and parades, the Honolulu Clean Cities Coalition has hosted and presented at workshops and seminars relating to clean fuels. To assist in delivering polished, professional presentations and well-run workshops, the Coalition uses computer-based presentations and LCD projection equipment. An LCD computer projector was purchased for this purpose.



## EXPENSES / COST SHARE

The original proposal stated that for every \$1 of funding provided by the U.S. Department of Energy for this project, \$1.20 would be provided by the partners. Actual contributions by project partners were significantly greater than this. The summary of partner contributions, both cash and in-kind, is provided below.

Activity	City and County of Honolulu	Gasco / EA Engineering	HECO / USN / HEVDP	Enova / GEM	HT&T / ESH	Cummins / Pacific Biodiesel	TOTAL
LPG Vehicle Conversions	\$ 10,032	\$ 8,470	\$ -	\$ -	\$ -	\$ 729	\$ 19,231
Co-sponsorship and support of the Hawaii "Electron Marathon"	\$ 1,337	\$ 162	\$ 116,189	\$ 289	\$ 155	\$ 643	\$ 118,775
Drafting, publication and distribution of ATF/AFV activity books	\$ 5,076	\$ 2,044	\$ 1,370	\$ 330	\$ 248	\$ 987	\$ 10,055
Exhibits, displays, and participation in conferences, trade shows, seminars, parades, and other events	\$ 15,297	\$ 16,661	\$ 10,001	\$ 4,369	\$ 2,236	\$ 5,876	\$ 54,439
<b>TOTAL</b>	<b>\$ 31,742</b>	<b>\$ 27,338</b>	<b>\$ 127,560</b>	<b>\$ 4,987</b>	<b>\$ 2,639</b>	<b>\$ 8,235</b>	<b>\$ 202,501</b>
<b>Cost match:</b>	<b>4.07 : 1</b>						
Federal:	\$ 49,789						
Non-Federal:	\$ 202,501						

## SUMMARY

The completed project is an excellent example of outreach programs to recruit new, non-traditional stakeholders. Effective means of sharing usable activities with other coalitions were demonstrated. The methods used to increase the visibility of alternative fuels and alternative fuel vehicles are recommended to other Clean Cities coalitions and groups seeking to broaden the community base of support and understanding of clean alternative fuels.



# Appendix

## Hours Contributed by Task

<b>LPG Vehicle Conversions</b>	City & County of Honolulu (prof.)	City & County of Honolulu (clerical)	Gasco / EA Engineering	HECO / USN / HEVDP	Enova / GEM	HT&T / ESH	Cummins / Pacific Biodiesel
Identify EPACT covered fleets in the anticipated private and municipal fleets Final Rule.	10	10	3				5
Identify fleets for potential participation in LPG conversion	10		10				5
Prepare, discuss, and review information packets on LPG	5	5	20				5
Prepare questionnaire	8	4	8				
Meet with fleets prior to LPG demonstration	60	30	60				
Deliver vehicle; discuss questionnaire; follow up	30	15	30				
Research requirements and costs for vehicle conversion	40		120				2
Project administration and reporting	20	10	10				
Subtotal	183	74	261	0	0	0	17

<b>Co-sponsorship and support of the Hawaii "Electron Marathon"</b>	City & County of Honolulu (prof.)	City & County of Honolulu (clerical)	Gasco / EA Engineering	HECO / USN / HEVDP	Enova / GEM	HT&T / ESH	Cummins / Pacific Biodiesel
Provide financial support to marathon.	10						
Participate in marathon-related activities prior to event	5	1		60	2		
Provide coalition display at marathon.	10			10			10
Evaluate success from event, review lessons learned.	5		5	5	5	5	5
Subtotal	30	1	5	75	7	5	15

<b>Drafting, publication and distribution of ATF/AFV activity books</b>	City & County of Honolulu (prof.)	City & County of Honolulu (clerical)	Gasco / EA Engineering	HECO / USN / HEVDP	Enova / GEM	HT&T / ESH	Cummins / Pacific Biodiesel
Draft activity book using stakeholder contributions.	40		40	20	5	5	10
Distribute first draft to stakeholders for review and comments.	10	2	3	3	3	3	3
Revise as needed and submit to schools for comment.	10	2					
Incorporate necessary changes and submit final form document for printing.	20	2					
Distribute activity books to schools.	20	2	20	20	0	0	10
Survey teachers on appearance, value and perception of book.	10	2					
Develop and test web-accessible version of activity book and original files	4		4	4	4	4	4
Respond to requests from others to use activities or receive copies of the activity books	10		4				
Update activity book	10		10	5	2	2	3
Re-print activity book	2		2	2			
Project administration and reporting	20	10	10				
Subtotal	110	10	63	43	8	8	23

Exhibits, displays, and participation in conferences, trade shows, seminars, parades, and other events		City & County of Honolulu (prof.)	City & County of Honolulu (clerical)	Gasco / EA Engineering	HECO / USN / HEVDP	Enova / GEM	HT&T / ESH	Cummins / Pacific Biodiesel
	Research, discuss and agree upon acceptable variety of educational and promotional items, signage, and graphics for exhibits and displays.	40	10	20	20	10	10	20
	Design educational and promotional items as necessary.	20		20	20	20	20	20
	Seek supplier with best price and value for items agreed upon.	20	2					
	Place order	5	2	2				
	Retrofit signage to existing stakeholders' AFV.	20	20	20	5	5	5	5
	Utilize new promotional items, signage, and graphics products at events:							
3/21/98	Electron Marathon, 8-1	6		6	6	6		6
6/5/98	Momilani Elem. School	5		5				
6/6/98	State Truck Driving Comp	7		4		6		3
9/10/98	HTA convention, Kauai	12		12				12
9/11/98	HTA convention, Kauai	6		6				6
9/12/98	HTA convention, Kauai	9		9				9
12/4/98	xmas parade	8		5	15		6	8
1/15/99	auto show to 1/16					12		
3/20/99	Electron Marathon, 8-1	6		6	60	6		6
3/30/99	"Energy, Economy, and Environment" symposium in conjunction with HSSEF							
12/4/99	xmas parade	10		3	15	10		5
3/25/00	Electron Marathon	7			60	7		
12/2/00	xmas parade	8			15	4	6	4
3/24/01	Electron Marathon	8				4		4
5/4/01	Mayor's Environmental Summit	6						7
5/5/01	Mayor's Environmental Summit	6						3
5/6/01	Mayor's Environmental Summit	6						2
12/1/01	xmas city lights parade	10			6	5	6	5
12/2/01	xmas parade-Waikiki	5			5			
3/23/02	Electron Marathon				75			
11/14/02	Ethanol Workshop						6	
12/7/02	xmas parade	12			5	4	6	5
	Provide financial and personnel support to stakeholders purchasing and displaying new AFV.	10	2	10				
	Ensure use of vehicle maximizes ATF/AFV exposure to the public.	2		2	2	2	2	2
	Survey public whenever possible at events to determine impact and influence of exhibits, displays, and outreach/promotional materials.	5		5	5	5	5	5
Subtotal		259	36	135	314	106	72	137

## Cash Contributions from Partners by Task

Electron Marathon	1998	\$	43,200.00
	1999	\$	21,850.00
	2000	\$	15,750.00
	2001	\$	15,000.00
	2002	\$	18,000.00
			<u>          </u>
from HECO:		\$	113,800.00

Truck	Cost	\$	24,279.95
	Fed. Funds	\$	(12,000.00)
			<u>          </u>
From Gasco:		\$	12,279.95

Christmas Parade	1998	\$	600.00
	1999	\$	600.00
	2000	\$	600.00
	2001	\$	600.00
	2002	\$	600.00
			<u>          </u>
from City and County:		\$	3,000.00

**Project Expenditures**

DATE	REF #			
2/16/1999	SWV 2120		\$5,000.00	Clean Cities: for electron marathon
9/1/2000	B458		\$15,307.00	ToCC:\$12000 for LPG truck; \$1807 for 1000 activitybooks; \$1500 for exhibit items
9/6/2001	B596	Printing/Display	\$6,867.66	Skyline and Hagadone
				PO6018 7/12/01 \$2201.03 Skyline tabletop display
				PO6019 8/21/01 \$4663.51 Hagadone 5000 activity books
9/6/2001	B598	Workshop/Printing	\$347.91	PO6020 Fleet Street Graphics 100 bumperstickers
2/6/2002	B2075	Contract	\$13,776.83	PO6045 Hagadone 1200 (6 types x 200) decals
5/28/2003	B2704	Other	\$25.94	Kinko's - printing and lamination of 11"x17" posters
7/9/2003	B00021	Equipment	\$3,719.96	PO Monsterdisplays.com (3) 6' tabletops
7/9/2003	B00021	Equipment	\$1,350.96	PO HewlettPackard LCD Projector
7/9/2003	B00021	Other	\$2,052.32	PO18375 Marketing Connections 5000 pens bicstickclik clear
		subtotal	\$48,448.58	
indirect charges				
2003	0.00%	7,149.18	0.00	
2002	3.29%	20,992.40	690.65	
2001	0.00%	0.00	0.00	
2000	3.17%	15,307.00	485.23	
1999	3.29%	5,000.00	164.50	
1998	5.07%		0.00	
		indirect	\$ 1,340.38	
		grand total	\$49,788.96	



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96813-5510

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Oahu Fleet Safety Organization

Pacific Biodiesel

Pacific Machinery

Pacific International Center for High  
Technology Research

Pacific Biowaste Technology

Department of Energy,  
Pacific Site Office

U.S. Electricar

U.S. General Services Administration,  
Fleet Management Branch

## RECORD OF DRIVER'S COMMENTS FOR THIS VEHICLE

START DATE 7/1/98	START MILEAGE 186	END DATE 10/21/98	END MILEAGE 1021	END TIME 5:00 p.m.
MAKE Ford	MODEL F-250	DRIVER'S NAME & SIGNATURE Brad Saito		
MODEL YEAR 1998	ENGINE/FUEL 5.4L/Bi-Fuel Propane/Gasoline	DRIVER'S BUSINESS NAME AND ADDRESS The Gas Company 594-5584 office P.O. Box 3000 251-0244 pager Honolulu, HI 96802-3000		

### DRIVER'S OPINIONS

RANGE OF THIS VEHICLE AS COMPARED TO THE SAME TYPE OF VEHICLE FUELED WITH GASOLINE:

☐ MUCH WORSE ☐ SLIGHTLY WORSE ☒ ROUGHLY THE SAME ☐ SLIGHTLY BETTER ☐ MUCH BETTER

ACCELERATION OF THIS VEHICLE AS COMPARED TO THE SAME TYPE OF VEHICLE FUELED WITH GASOLINE:

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OVERALL HANDLING OF THIS VEHICLE AS COMPARED TO THE SAME TYPE OF VEHICLE FUELED WITH GASOLINE:

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WOULD YOU CONSIDER BUYING A VEHICLE OF THE SAME MAKE WITH THE SAME ENGINE AND FUEL SYSTEM?:

☒ YES ☐ NO

### DRIVER'S COMMENTS

(Good or Bad, we value your impression of this vehicle. Please give us your comments.)



160 Ahui Street  
Honolulu, Hawaii  
96813-5510

Telephone:  
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Facsimile:  
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Oahu Fleet Safety Organization

Pacific Biodiesel

Pacific Machinery

Pacific International Center for High  
Technology Research

Unilayn Biowaste Technology

Department of Energy,  
Pacific Site Office

U.S. Electric

U.S. General Services Administration,  
Fleet Management Branch

## RECORD OF DRIVER'S COMM

START DATE 8/4/98	START MILEAGE 1021	END DATE 8/4/99
MAKE Ford	MODEL F-250	DRIVER'S N
MODEL YEAR 1998	ENGINE/FUEL 5.4L/Bi-Fuel Propane/Gasoline	DRIVER'S B

Stafford J Kiguchi  
Manager Communications

841 Bishop Street Suite 1700  
PO Box 3000 Honolulu Hawaii 96802 3000  
Telephone 808 535 5928  
Fax 808 535 5944

### DRIVER'S OPINIONS

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☐ YES ☐ NO

### DRIVER'S COMMENTS

(Good or Bad, we value your impression of this vehicle. Please give us your comments.)

*Was very impressed with overall performance. Good acceleration  
both from standstill and moving positions. Did not feel  
any difference switching between fuels.*



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U.S. Electricar

U.S. General Services Administration,  
Fleet Management Branch

THE GAS COMPANY  
Citizens Energy Services

## RECORD OF DRIVER'S COMMENTS

START DATE 8/5/98	START MILEAGE 1031	END DATE 8/7/98
MAKE Ford	MODEL F-250	DRIVER'S I J
MODEL YEAR 1998	ENGINE/FUEL 5.4L/Bi-Fuel Propane/Gasoline	DRIVER'S I The Gas Company VP + Gen. Mgr.

Jim R Yates

Vice President & General Manager

841 Bishop Street, Suite 1700  
PO Box 3090 Honolulu Hawaii 96802-3000  
Telephone: 808 535 5908  
Fax: 808 535 5942  
E-mail: jyates@gas.com

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WOULD YOU CONSIDER BUYING A VEHICLE OF THE SAME MAKE WITH THE SAME ENGINE AND FUEL SYSTEM?:

☒ YES

☐ NO

## DRIVER'S COMMENTS

(Good or Bad, we value your impression of this vehicle. Please give us your comments.)

Very impressed AF vehicle.

Jim Yates



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U.S. Department of Energy,  
Pacific Site Office

U.S. Electric

U.S. General Services Administration,  
Fleet Management Branch

## RECORD OF DRIVER'S COMMENTS FOR THIS VEHICLE

START DATE 12 AUGUST 98	START MILEAGE 1197	END DATE 8/20/98	END MILEAGE 1530	END TIME 9:20
MAKE Ford	MODEL F-250	DRIVER'S NAME & SIGNATURE Kyle Nakamura		
MODEL YEAR 1998	ENGINE/FUEL 5.4L/Bi-Fuel Propane/Gasoline	DRIVER'S BUSINESS NAME AND ADDRESS Island Movers Inc PO Box 17865 Hon, HI 96817		

### DRIVER'S OPINIONS

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OVERALL HANDLING OF THIS VEHICLE AS COMPARED TO THE SAME TYPE OF VEHICLE FUELED WITH GASOLINE:

☐ MUCH WORSE ☐ SLIGHTLY WORSE ☐ ROUGHLY THE SAME ☐ SLIGHTLY BETTER ☐ MUCH BETTER

CARGO CAPACITY OF THIS VEHICLE AS COMPARED TO THE SAME TYPE OF VEHICLE FUELED WITH GASOLINE:

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EASE OF OPERATION OF THIS VEHICLE AS COMPARED TO THE SAME TYPE OF VEHICLE FUELED WITH GASOLINE:

☐ MUCH WORSE ☐ SLIGHTLY WORSE ☐ ROUGHLY THE SAME ☐ SLIGHTLY BETTER ☐ MUCH BETTER

OVERALL OPINION OF THIS VEHICLE AS COMPARED TO THE SAME TYPE OF VEHICLE FUELED WITH GASOLINE:

☐ MUCH WORSE ☐ SLIGHTLY WORSE ☒ ROUGHLY THE SAME ☐ SLIGHTLY BETTER ☐ MUCH BETTER

WOULD YOU CONSIDER BUYING A VEHICLE OF THE SAME MAKE WITH THE SAME ENGINE AND FUEL SYSTEM?:

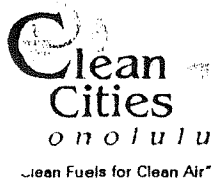
☐ YES

☐ NO

### DRIVER'S COMMENTS

(Good or Bad, we value your impression of this vehicle. Please give us your comments.)

Propane wasn't running properly. Used mostly gasoline



160 Ahui Street  
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Fleet Management Branch

## RECORD OF DRIVER'S COMMENTS FOR THIS VEHICLE

START DATE 10/24/98	START MILEAGE 2709	END DATE 11/2/98	END MILEAGE 3083	END TIME 13:30
MAKE Ford	MODEL F-250	DRIVER'S NAME & SIGNATURE DAVE SADERLUND <i>Dave Saderlund</i>		
MODEL YEAR 1998	ENGINE/FUEL 5.4L/Bi-Fuel Propane/Gasoline	DRIVER'S BUSINESS NAME AND ADDRESS TRAVEL PLAZA TRANSPORTATION, INC. 818 PINE ST HONOLULU, HI 96817		

### DRIVER'S OPINIONS

RANGE OF THIS VEHICLE AS COMPARED TO THE SAME TYPE OF VEHICLE FUELED WITH GASOLINE:

☐ MUCH WORSE ☐ SLIGHTLY WORSE ☒ ROUGHLY THE SAME ☐ SLIGHTLY BETTER ☐ MUCH BETTER

ACCELERATION OF THIS VEHICLE AS COMPARED TO THE SAME TYPE OF VEHICLE FUELED WITH GASOLINE:

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BRAKING OF THIS VEHICLE AS COMPARED TO THE SAME TYPE OF VEHICLE FUELED WITH GASOLINE:

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MANEUVERABILITY OF THIS VEHICLE AS COMPARED TO THE SAME TYPE OF VEHICLE FUELED WITH GASOLINE:

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OVERALL HANDLING OF THIS VEHICLE AS COMPARED TO THE SAME TYPE OF VEHICLE FUELED WITH GASOLINE:

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OVERALL OPINION OF THIS VEHICLE AS COMPARED TO THE SAME TYPE OF VEHICLE FUELED WITH GASOLINE:

☐ MUCH WORSE ☐ SLIGHTLY WORSE ☐ ROUGHLY THE SAME ☒ SLIGHTLY BETTER ☐ MUCH BETTER

WOULD YOU CONSIDER BUYING A VEHICLE OF THE SAME MAKE WITH THE SAME ENGINE AND FUEL SYSTEM?:

☒ YES

☐ NO

### DRIVER'S COMMENTS

(Good or Bad, we value your impression of this vehicle. Please give us your comments.)

WORKED GREAT ON BOTH FUELS.  
WENT UP HILL VERY WELL ON BOTH LP  
& GAS — NO DIFFERENCE. NICE TRUCK!



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## RECORD OF DRIVER'S COMMENTS FOR THIS VEHICLE

START DATE 9 Nov 98	START MILEAGE 3307	END DATE	END MILEAGE	END TIME
MAKE Ford	MODEL F-250	DRIVER'S NAME & SIGNATURE Ross Sasamura		
MODEL YEAR 1998	ENGINE/FUEL 5.4L/Bi-Fuel Propane/Gasoline	DRIVER'S BUSINESS NAME AND ADDRESS City & County of Honolulu Dept. of Facility Maintenance 160 Ahihi St. Honolulu, HI 96813-5510		

### DRIVER'S OPINIONS

RANGE OF THIS VEHICLE AS COMPARED TO THE SAME TYPE OF VEHICLE FUELED WITH GASOLINE:

☐ MUCH WORSE ☒ SLIGHTLY WORSE ☐ ROUGHLY THE SAME ☐ SLIGHTLY BETTER ☐ MUCH BETTER

ACCELERATION OF THIS VEHICLE AS COMPARED TO THE SAME TYPE OF VEHICLE FUELED WITH GASOLINE:

☐ MUCH WORSE ☐ SLIGHTLY WORSE ☒ ROUGHLY THE SAME ☐ SLIGHTLY BETTER ☐ MUCH BETTER

BRAKING OF THIS VEHICLE AS COMPARED TO THE SAME TYPE OF VEHICLE FUELED WITH GASOLINE:

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MANEUVERABILITY OF THIS VEHICLE AS COMPARED TO THE SAME TYPE OF VEHICLE FUELED WITH GASOLINE:

☐ MUCH WORSE ☐ SLIGHTLY WORSE ☒ ROUGHLY THE SAME ☐ SLIGHTLY BETTER ☐ MUCH BETTER

OVERALL HANDLING OF THIS VEHICLE AS COMPARED TO THE SAME TYPE OF VEHICLE FUELED WITH GASOLINE:

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CARGO CAPACITY OF THIS VEHICLE AS COMPARED TO THE SAME TYPE OF VEHICLE FUELED WITH GASOLINE:

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EASE OF OPERATION OF THIS VEHICLE AS COMPARED TO THE SAME TYPE OF VEHICLE FUELED WITH GASOLINE:

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OVERALL OPINION OF THIS VEHICLE AS COMPARED TO THE SAME TYPE OF VEHICLE FUELED WITH GASOLINE:

☐ MUCH WORSE ☐ SLIGHTLY WORSE ☒ ROUGHLY THE SAME ☐ SLIGHTLY BETTER ☐ MUCH BETTER

WOULD YOU CONSIDER BUYING A VEHICLE OF THE SAME MAKE WITH THE SAME ENGINE AND FUEL SYSTEM?:

☒ YES

☐ NO

### DRIVER'S COMMENTS

(Good or Bad, we value your impression of this vehicle. Please give us your comments.)

NO APPRECIABLE DIFFERENCE IN FUEL USED! VEHICLE IS  
"TRANSPARENT" IN TERMS OF FUEL TYPE & OPERATOR'S  
NEED TO "ADJUST" TO DIFFERENT FUELS. THIS VEHICLE  
CAN READILY BE MARKETED TO PRIVATE OWNERSHIP BY  
NON-COMMERCIAL USERS IN AREAS WITH ADEQUATE  
REFUELING INFRASTRUCTURE. RECOMMEND HIGH PROFILE  
ADVERTISING OF THE AVAILABILITY OF THIS VEHICLE!



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## RECORD OF DRIVER'S COMMENTS FOR THIS VEHICLE

START DATE 11/17/98	START MILEAGE 3587	END DATE <sup>23</sup> 11/20/98	END MILEAGE 4364	END TIME
MAKE Ford	MODEL F-250	DRIVER'S NAME & SIGNATURE CONTACT: ROY TAKIMOTO BRIAN NOMURA <i>Brian Nomura</i>		
MODEL YEAR 1998	ENGINE/FUEL 5.4L/Bi-Fuel Propane/Gasoline	DRIVER'S BUSINESS NAME AND ADDRESS GRACE PACIFIC CORP. PO Box 78 Hon, HI 96810		

### DRIVER'S OPINIONS

RANGE OF THIS VEHICLE AS COMPARED TO THE SAME TYPE OF VEHICLE FUELED WITH GASOLINE:

☐ MUCH WORSE ☒ SLIGHTLY WORSE ☒ ROUGHLY THE SAME ☐ SLIGHTLY BETTER ☐ MUCH BETTER

ACCELERATION OF THIS VEHICLE AS COMPARED TO THE SAME TYPE OF VEHICLE FUELED WITH GASOLINE:

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☐ MUCH WORSE ☐ SLIGHTLY WORSE ☒ ROUGHLY THE SAME ☐ SLIGHTLY BETTER ☐ MUCH BETTER

WOULD YOU CONSIDER BUYING A VEHICLE OF THE SAME MAKE WITH THE SAME ENGINE AND FUEL SYSTEM?:

☒ YES ☐ NO

### DRIVER'S COMMENTS

(Good or Bad, we value your impression of this vehicle. Please give us your comments.)

- 1) VEHICLE DRIVEN ON PROPANE RUNS LITTLE MORE SMOOTH
- 2) VEHICLE DRIVEN ON GAS HAS SLIGHTLY MORE POWER
- 3) VEHICLE ON PROPANE HAD LITTLE OVER 10 ~~MPG~~ MILES PER GALLON
- 4) THIS VEHICLE RUNS WELL ON BOTH FUEL SYSTEMS &  
IS A VERY GOOD TRUCK.



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## RECORD OF DRIVER'S COMMENTS FOR THIS VEHICLE

START DATE 11-24-98	START MILEAGE 4364	END DATE 12-2-98	END MILEAGE 4642	END TIME
MAKE Ford	MODEL F-250	DRIVER'S NAME & SIGNATURE Yerme Santos		
MODEL YEAR 1998	ENGINE/FUEL 5.4L/Bi-Fuel Propane/Gasoline	DRIVER'S BUSINESS NAME AND ADDRESS B and C Trucking Co., Ltd. P.O. Box 700 Hialeah, HI 96701		

### DRIVER'S OPINIONS

RANGE OF THIS VEHICLE AS COMPARED TO THE SAME TYPE OF VEHICLE FUELED WITH GASOLINE:

☐ MUCH WORSE ☒ SLIGHTLY WORSE ☐ ROUGHLY THE SAME ☐ SLIGHTLY BETTER ☐ MUCH BETTER

ACCELERATION OF THIS VEHICLE AS COMPARED TO THE SAME TYPE OF VEHICLE FUELED WITH GASOLINE:

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BRAKING OF THIS VEHICLE AS COMPARED TO THE SAME TYPE OF VEHICLE FUELED WITH GASOLINE:

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MANEUVERABILITY OF THIS VEHICLE AS COMPARED TO THE SAME TYPE OF VEHICLE FUELED WITH GASOLINE:

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OVERALL HANDLING OF THIS VEHICLE AS COMPARED TO THE SAME TYPE OF VEHICLE FUELED WITH GASOLINE:

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CARGO CAPACITY OF THIS VEHICLE AS COMPARED TO THE SAME TYPE OF VEHICLE FUELED WITH GASOLINE:

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OVERALL OPINION OF THIS VEHICLE AS COMPARED TO THE SAME TYPE OF VEHICLE FUELED WITH GASOLINE:

☐ MUCH WORSE ☐ SLIGHTLY WORSE ☒ ROUGHLY THE SAME ☐ SLIGHTLY BETTER ☐ MUCH BETTER

WOULD YOU CONSIDER BUYING A VEHICLE OF THE SAME MAKE WITH THE SAME ENGINE AND FUEL SYSTEM?:

☒ YES

☐ NO

### DRIVER'S COMMENTS

(Good or Bad, we value your impression of this vehicle. Please give us your comments.)

Smooth running & quiet. Propane, power  
was impressive. Propane tank takes up  
some bed space.

FORD TOUGH!



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## RECORD OF DRIVER'S COMMENTS FOR THIS VEHICLE

START DATE 12/9/98	START MILEAGE 4748	END DATE 12-17-98	END MILEAGE 5151	END TIME
MAKE Ford	MODEL F-250	DRIVER'S NAME & SIGNATURE DENNIS WASHBURN		
MODEL YEAR 1998	ENGINE/FUEL 5.4L/Bi-Fuel Propane/Gasoline	DRIVER'S BUSINESS NAME AND ADDRESS EAGLE FLEET SERVICES 99-1269 IWAENA ST AIEA HI		

### DRIVER'S OPINIONS

RANGE OF THIS VEHICLE AS COMPARED TO THE SAME TYPE OF VEHICLE FUELED WITH GASOLINE:

☐ MUCH WORSE ☒ SLIGHTLY WORSE ☐ ROUGHLY THE SAME ☐ SLIGHTLY BETTER ☐ MUCH BETTER

ACCELERATION OF THIS VEHICLE AS COMPARED TO THE SAME TYPE OF VEHICLE FUELED WITH GASOLINE:

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OVERALL HANDLING OF THIS VEHICLE AS COMPARED TO THE SAME TYPE OF VEHICLE FUELED WITH GASOLINE:

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CARGO CAPACITY OF THIS VEHICLE AS COMPARED TO THE SAME TYPE OF VEHICLE FUELED WITH GASOLINE:

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☐ MUCH WORSE ☐ SLIGHTLY WORSE ☒ ROUGHLY THE SAME ☐ SLIGHTLY BETTER ☐ MUCH BETTER

WOULD YOU CONSIDER BUYING A VEHICLE OF THE SAME MAKE WITH THE SAME ENGINE AND FUEL SYSTEM?:

☒ YES ☐ NO

### DRIVER'S COMMENTS

(Good or Bad, we value your impression of this vehicle. Please give us your comments.)

PROPANE TANK NEEDS TO BE OUT OF THE BED.  
OTHERWISE THE DIFFERENCE IN OPERATION LPG/GAS  
IS MINOR. HERE IN HI IT WILL TAKE SOME  
TIME TO HAVE LPG READILY AVAILABLE.

NICE TRUCK, THANKS FOR THE OPPORTUNITY  
TO PARTICIPATE.



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## RECORD OF DRIVER'S COMMENTS FOR THIS VEHICLE

START DATE <b>18 Dec 98</b>	START MILEAGE <b>5168</b>	END DATE <b>4 Jan 98</b>	END MILEAGE <b>5952</b>	END TIME
MAKE <b>Ford</b>	MODEL <b>F-250</b>	DRIVER'S NAME & SIGNATURE <b>DAN KINOSHITA</b>		
MODEL YEAR <b>1998</b>	ENGINE/FUEL <b>5.4L/Bi-Fuel Propane/Gasoline</b>	DRIVER'S BUSINESS NAME AND ADDRESS <b>HONOLULU TRANSFER &amp; STOR 1122 MIKOLE ST. HONOLULU HI 96819</b>		

### DRIVER'S OPINIONS

RANGE OF THIS VEHICLE AS COMPARED TO THE SAME TYPE OF VEHICLE FUELED WITH GASOLINE:

☐ MUCH WORSE ☒ SLIGHTLY WORSE ☐ ROUGHLY THE SAME ☐ SLIGHTLY BETTER ☐ MUCH BETTER

ACCELERATION OF THIS VEHICLE AS COMPARED TO THE SAME TYPE OF VEHICLE FUELED WITH GASOLINE:

☐ MUCH WORSE ☒ SLIGHTLY WORSE ☐ ROUGHLY THE SAME ☐ SLIGHTLY BETTER ☐ MUCH BETTER

BRAKING OF THIS VEHICLE AS COMPARED TO THE SAME TYPE OF VEHICLE FUELED WITH GASOLINE:

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MANEUVERABILITY OF THIS VEHICLE AS COMPARED TO THE SAME TYPE OF VEHICLE FUELED WITH GASOLINE:

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OVERALL HANDLING OF THIS VEHICLE AS COMPARED TO THE SAME TYPE OF VEHICLE FUELED WITH GASOLINE:

☐ MUCH WORSE ☐ SLIGHTLY WORSE ☒ ROUGHLY THE SAME ☐ SLIGHTLY BETTER ☐ MUCH BETTER

CARGO CAPACITY OF THIS VEHICLE AS COMPARED TO THE SAME TYPE OF VEHICLE FUELED WITH GASOLINE:

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EASE OF OPERATION OF THIS VEHICLE AS COMPARED TO THE SAME TYPE OF VEHICLE FUELED WITH GASOLINE:

☐ MUCH WORSE ☐ SLIGHTLY WORSE ☒ ROUGHLY THE SAME ☐ SLIGHTLY BETTER ☐ MUCH BETTER

OVERALL OPINION OF THIS VEHICLE AS COMPARED TO THE SAME TYPE OF VEHICLE FUELED WITH GASOLINE:

☐ MUCH WORSE ☒ SLIGHTLY WORSE ☐ ROUGHLY THE SAME ☐ SLIGHTLY BETTER ☐ MUCH BETTER

WOULD YOU CONSIDER BUYING A VEHICLE OF THE SAME MAKE WITH THE SAME ENGINE AND FUEL SYSTEM?:

☒ YES

☐ NO

### DRIVER'S COMMENTS

(Good or Bad, we value your impression of this vehicle. Please give us your comments.)

Engine runs very smooth on propane hot or cold. Fuel tank in bed takes up too much space. At this time cost of fuel to operate is too high (10 mpg on propane vs. 15.8 mpg on gas @ \$.20/gal less). Engine purrs at higher rpm but is really limited by poor gearing in Trans. Very nice truck, a real head turner everywhere I went! If this truck could be more fuel efficient on propane, I would definitely have a propane truck of my own.



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Fleet Management Branch

## RECORD OF DRIVER'S COMMENTS FOR THIS VEHICLE

START DATE 1-5-99	START MILEAGE 5976	END DATE 1-11-99	END MILEAGE 6132	END TIME 0630
MAKE Ford	MODEL F-250	DRIVER'S NAME & SIGNATURE STEVE PIPER		
MODEL YEAR 1998	ENGINE/FUEL 5.4L/Bi-Fuel Propane/Gasoline	DRIVER'S BUSINESS NAME AND ADDRESS PUNAHOU School 1601 PUNAHOU ST Honolulu, HI 96822		

### DRIVER'S OPINIONS

RANGE OF THIS VEHICLE AS COMPARED TO THE SAME TYPE OF VEHICLE FUELED WITH GASOLINE:

☐ MUCH WORSE ☒ SLIGHTLY WORSE ☐ ROUGHLY THE SAME ☐ SLIGHTLY BETTER ☐ MUCH BETTER

ACCELERATION OF THIS VEHICLE AS COMPARED TO THE SAME TYPE OF VEHICLE FUELED WITH GASOLINE:

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BRAKING OF THIS VEHICLE AS COMPARED TO THE SAME TYPE OF VEHICLE FUELED WITH GASOLINE:

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MANEUVERABILITY OF THIS VEHICLE AS COMPARED TO THE SAME TYPE OF VEHICLE FUELED WITH GASOLINE:

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OVERALL HANDLING OF THIS VEHICLE AS COMPARED TO THE SAME TYPE OF VEHICLE FUELED WITH GASOLINE:

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☐ MUCH WORSE ☒ SLIGHTLY WORSE ☐ ROUGHLY THE SAME ☐ SLIGHTLY BETTER ☐ MUCH BETTER

WOULD YOU CONSIDER BUYING A VEHICLE OF THE SAME MAKE WITH THE SAME ENGINE AND FUEL SYSTEM?:

☐ YES ☒ NO

### DRIVER'S COMMENTS

(Good or Bad, we value your impression of this vehicle. Please give us your comments.)

Over-all performance of vehicle on LP is less than gas  
hesitation on acceleration on LP  
Constant UP shift - down shift on hilly operation on LP  
Rough idle on LP  
Bed too small w/ tank in bed  
Set-up would be okay as a work truck but for those  
who like "driving" trucks - I don't think so.  
Where does one refuel w/ propane? in HAWAII



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## RECORD OF DRIVER'S COMMENTS FOR THIS VEHICLE

START DATE 11 Jan 98	START MILEAGE 6136	END DATE 22 JAN 98	END MILEAGE 6469	END TIME 0841
MAKE Ford	MODEL F-250	DRIVER'S NAME & SIGNATURE Brian Lau		
MODEL YEAR 1998	ENGINE/FUEL 5.4L/Bi-Fuel Propane/Gasoline	DRIVE Fm P.1 Hc		

Brian Y. C. Lau  
Vice President

### DRIVER'S

#### RANGE OF THIS VEHICLE AS COMPARED TO THE SAME TYPE

☐ MUCH WORSE ☒ SLIGHTLY WORSE ☐ ROUGHLY

#### ACCELERATION OF THIS VEHICLE AS COMPARED TO THE SAME TYPE OF VEHICLE FUELED WITH GASOLINE:

☐ MUCH WORSE ☐ SLIGHTLY WORSE ☒ ROUGHLY THE SAME ☐ SLIGHTLY BETTER ☐ MUCH BETTER

#### BRAKING OF THIS VEHICLE AS COMPARED TO THE SAME TYPE OF VEHICLE FUELED WITH GASOLINE:

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#### MANEUVERABILITY OF THIS VEHICLE AS COMPARED TO THE SAME TYPE OF VEHICLE FUELED WITH GASOLINE:

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#### OVERALL HANDLING OF THIS VEHICLE AS COMPARED TO THE SAME TYPE OF VEHICLE FUELED WITH GASOLINE:

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☐ MUCH WORSE ☐ SLIGHTLY WORSE ☒ ROUGHLY THE SAME ☐ SLIGHTLY BETTER ☐ MUCH BETTER

#### WOULD YOU CONSIDER BUYING A VEHICLE OF THE SAME MAKE WITH THE SAME ENGINE AND FUEL SYSTEM?:

☒ YES ☐ NO

### DRIVER'S COMMENTS

(Good or Bad, we value your impression of this vehicle. Please give us your comments.)

Overall performance with propane is acceptable. I did not have the opportunity to push it, i.e. accelerate from zero to 60 on an open highway. The acceleration using propane was slightly less efficient on a cold engine than using gasoline. However, with a warm engine, I did not detect any difference. My driving was 80% city and 20% highway, and noticed worse mileage per gallon with the propane. I used 0.75 of the propane tank and logged 203.1 miles. After 100 miles on gasoline, my gauge indicated I used roughly 0.25 of a full tank. I would suggest a small gasoline tank as a reserve, so the propane tank in the bed of the demo vehicle could be sized down or incorporated elsewhere. Taking up bed space would not appeal to any truck user, unless you raised the entire bed. Cruising and passing were identical using either fuel. The manufacturers together with any taxing authorities should partner in creating incentives for propane dispensing firms at the wholesale and retail level.



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## RECORD OF DRIVER'S COMMENTS FOR THIS VEHICLE

START DATE 25 Jan 99	START MILEAGE 6540	END DATE	END MILEAGE	END TIME
MAKE Ford	MODEL F-250	DRIVER'S NAME & SIGNATURE BRIAN NISHIDA		
MODEL YEAR 1998	ENGINE/FUEL 5.4L/Bi-Fuel Propane/Gasoline	DRIVER'S 		

BRIAN C. NISHIDA  
Vice President  
General Manager

### DRIVER'S C

#### RANGE OF THIS VEHICLE AS COMPARED TO THE SAME TYPE OF

☐ MUCH WORSE ☐ SLIGHTLY WORSE ☒ ROUGHLY THE SAME ☐ SLIGHTLY BETTER ☐ MUCH BETTER

#### ACCELERATION OF THIS VEHICLE AS COMPARED TO THE SAME TYPE OF VEHICLE FUELED WITH GASOLINE:

☐ MUCH WORSE ☐ SLIGHTLY WORSE ☒ ROUGHLY THE SAME ☐ SLIGHTLY BETTER ☐ MUCH BETTER

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#### MANEUVERABILITY OF THIS VEHICLE AS COMPARED TO THE SAME TYPE OF VEHICLE FUELED WITH GASOLINE:

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#### OVERALL OPINION OF THIS VEHICLE AS COMPARED TO THE SAME TYPE OF VEHICLE FUELED WITH GASOLINE:

☐ MUCH WORSE ☐ SLIGHTLY WORSE ☒ ROUGHLY THE SAME ☐ SLIGHTLY BETTER ☐ MUCH BETTER

#### WOULD YOU CONSIDER BUYING A VEHICLE OF THE SAME MAKE WITH THE SAME ENGINE AND FUEL SYSTEM?:

☒ YES ☐ NO

### DRIVER'S COMMENTS

(Good or Bad, we value your impression of this vehicle. Please give us your comments.)

I was pleasantly surprised at the good performance  
Engine size & gearing provided satisfactory power,  
even in off-road conditions. Fuel tank  
position reduced cargo space. Auto shut-off valve  
feature made re-fueling simple, but position of  
buzzer valve was inconvenient. Overall very  
positive experience. Access to propane for the  
average consumer would be a difficulty.



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## RECORD OF DRIVER'S COMMENTS FOR THIS VEHICLE

START DATE <i>22 Feb 99</i> <i>2/22/99</i>	START MILEAGE <i>1733</i>	END DATE <i>22 Mar 99</i>	END MILEAGE <i>9218</i>	END TIME
MAKE <b>Ford</b>	MODEL <b>F-250</b>	DRIVER'S NAME & SIGNATURE <i>Naalet Keaunui Naalet Keaunui</i>		
MODEL YEAR <b>1998</b>	ENGINE/FUEL <b>5.4L/Bi-Fuel Propane/Gasoline</b>	DRIVER'S BUSINESS NAME AND ADDRESS <i>Unisyn 41-249 Waikupanaha Street Waimanalo, HI 96795</i>		

### DRIVER'S OPINIONS

#### RANGE OF THIS VEHICLE AS COMPARED TO THE SAME TYPE OF VEHICLE FUELED WITH GASOLINE:

☐ MUCH WORSE ☐ SLIGHTLY WORSE ☒ ROUGHLY THE SAME ☐ SLIGHTLY BETTER ☐ MUCH BETTER

#### ACCELERATION OF THIS VEHICLE AS COMPARED TO THE SAME TYPE OF VEHICLE FUELED WITH GASOLINE:

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#### MANEUVERABILITY OF THIS VEHICLE AS COMPARED TO THE SAME TYPE OF VEHICLE FUELED WITH GASOLINE:

☐ MUCH WORSE ☐ SLIGHTLY WORSE ☒ ROUGHLY THE SAME ☐ SLIGHTLY BETTER ☐ MUCH BETTER

#### OVERALL HANDLING OF THIS VEHICLE AS COMPARED TO THE SAME TYPE OF VEHICLE FUELED WITH GASOLINE:

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#### CARGO CAPACITY OF THIS VEHICLE AS COMPARED TO THE SAME TYPE OF VEHICLE FUELED WITH GASOLINE:

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#### EASE OF OPERATION OF THIS VEHICLE AS COMPARED TO THE SAME TYPE OF VEHICLE FUELED WITH GASOLINE:

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#### WOULD YOU CONSIDER BUYING A VEHICLE OF THE SAME MAKE WITH THE SAME ENGINE AND FUEL SYSTEM?:

☒ YES ☐ NO

### DRIVER'S COMMENTS

(Good or Bad, we value your impression of this vehicle. Please give us your comments.)

*Slight hesitation when accelerating. Obviously cargo space is less due to propane tank. Overall, performance was great!*



Unisyn

Waimanalo, Hawaii

NAALEI KEAUNUI



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## RECORD OF DRIVER'S COMMENTS FOR THIS VEHICLE

START DATE 5 Apr 99	START MILEAGE 9441	END DATE 18 May 99	END MILEAGE 1081	END TIME
MAKE Ford	MODEL F-250	DRIVER'S NAME & SIGNATURE Bar Post		
MODEL YEAR 1998	ENGINE/FUEL 5.4L/Bi-Fuel Propane/Gasoline	DRIVER'S BUSINESS NAME AND ADDRESS ENOA Corp 1141 Waimanu St Hon H: 96814		

### DRIVER'S OPINIONS

RANGE OF THIS VEHICLE AS COMPARED TO THE SAME TYPE OF VEHICLE FUELED WITH GASOLINE:

☐ MUCH WORSE ☐ SLIGHTLY WORSE ☒ ROUGHLY THE SAME ☐ SLIGHTLY BETTER ☐ MUCH BETTER

ACCELERATION OF THIS VEHICLE AS COMPARED TO THE SAME TYPE OF VEHICLE FUELED WITH GASOLINE:

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WOULD YOU CONSIDER BUYING A VEHICLE OF THE SAME MAKE WITH THE SAME ENGINE AND FUEL SYSTEM?:

☐ YES

☐ NO

### DRIVER'S COMMENTS

(Good or Bad, we value your impression of this vehicle. Please give us your comments.)

Enjoyed Driving this truck. Cargo area too small for our needs. Cost of Propane a little to high.  
Thank you for letting us use the truck and participate.



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## RECORD OF DRIVER'S COMMENTS FOR THIS VEHICLE

START DATE 12 July 99	START MILEAGE 10914	END DATE 8-11-99	END MILEAGE 12337	END TIME 1:00 PM
MAKE Ford	MODEL F-250	DRIVER'S NAME & SIGNATURE <i>[Signature]</i>		
MODEL YEAR 1998	ENGINE/FUEL 5.4L/Bi-Fuel Propane/Gasoline	DRIVER'S BUSINESS NAME AND ADDRESS ERIC ENJADA HT & T CO. INC.		

### DRIVER'S OPINIONS

RANGE OF THIS VEHICLE AS COMPARED TO THE SAME TYPE OF VEHICLE FUELED WITH GASOLINE:

☐ MUCH WORSE ☐ SLIGHTLY WORSE ☒ ROUGHLY THE SAME ☐ SLIGHTLY BETTER ☐ MUCH BETTER

ACCELERATION OF THIS VEHICLE AS COMPARED TO THE SAME TYPE OF VEHICLE FUELED WITH GASOLINE:

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CARGO CAPACITY OF THIS VEHICLE AS COMPARED TO THE SAME TYPE OF VEHICLE FUELED WITH GASOLINE:

☐ MUCH WORSE ☒ SLIGHTLY WORSE ☐ ROUGHLY THE SAME ☐ SLIGHTLY BETTER ☐ MUCH BETTER

EASE OF OPERATION OF THIS VEHICLE AS COMPARED TO THE SAME TYPE OF VEHICLE FUELED WITH GASOLINE:

☐ MUCH WORSE ☐ SLIGHTLY WORSE ☒ ROUGHLY THE SAME ☐ SLIGHTLY BETTER ☐ MUCH BETTER

OVERALL OPINION OF THIS VEHICLE AS COMPARED TO THE SAME TYPE OF VEHICLE FUELED WITH GASOLINE:

☐ MUCH WORSE ☒ SLIGHTLY WORSE ☐ ROUGHLY THE SAME ☐ SLIGHTLY BETTER ☐ MUCH BETTER

WOULD YOU CONSIDER BUYING A VEHICLE OF THE SAME MAKE WITH THE SAME ENGINE AND FUEL SYSTEM?:

☐ YES

☒ NO

### DRIVER'S COMMENTS

(Good or Bad, we value your impression of this vehicle. Please give us your comments.)

*HESITATION DURING ACCELERATION FROM THE IDLE POSITION. POSSIBLE  
ADJUSTMENT OR FINE TUNING NEEDED.  
I NOTICED IT TOOK LONGER TO START THE VEHICLE  
WITH THE PROPANE COMPARED TO THE GAS, ESPECIALLY  
DURING COLD STARTS. OVERALL THE VEHICLE RAN FINE  
AND NO DIFFERENCES BETWEEN THE (2) DIFFERENT TYPES  
OF FUEL WERE NOTED. I ESPECIALLY LIKE THE LONG RANGE  
OF MILES BETWEEN FILL UPS! (EXCELLENT TRUCK.)*



Clean Fuels for Clean Air™

160 Ahui Street  
Honolulu, Hawaii  
96813-5510

Telephone:  
(808)523-4171

Facsimile:  
(808)538-7899

Officers:

President

Ross Sasamura, P.E.  
City & County of Honolulu  
Department of Public Works

Vice-President

Lloyd Ennor  
Cummins Hawaii  
Diesel Power, Inc.

Secretary

Jack Bowman  
U.S. Electric

Treasurer

Brad Saito  
The Gas Company

Stakeholders:

City and County of Honolulu

State of Hawaii, Department of  
Business, Economic Development and  
Tourism

American Lung Association of Hawaii

American Public Works Association -  
Hawaii Chapter

Ameron HC & D

Brewer Environmental Ind. LLC

The Gas Company

Cummins Hawaii Diesel Power, Inc.

Electric Vehicle Association  
of Hawaii

Fleet Street Graphics

HT & T Truck Center

Hawaii Detroit Diesel Allison

Hawaii Electric Vehicle Demonstration  
Project

Hawaii Natural Energy Institute

Hawaii Transportation Association

Hawaiian Electric Co.

Oahu Fleet Safety Organization

Pacific Biodiesel

Pacific Machinery

Pacific International Center for High  
Technology Research

Unileyn Biowaste Technology

U.S. Department of Energy,  
Pacific Site Office

U.S. Electric

U.S. General Services Administration,  
Fleet Management Branch

## RECORD OF DRIVER'S COMMENTS FOR THIS VEHICLE

START DATE 11 Aug 99	START MILEAGE 12348	END DATE 9-6-99	END MILEAGE 11026	END TIME 12:00
MAKE Ford	MODEL F-250	DRIVER'S NAME & SIGNATURE Jesse Hanson		
MODEL YEAR 1998	ENGINE/FUEL 5.4L/Bi-Fuel Propane/Gasoline	DRIVER'S BUSINESS NAME AND ADDRESS Schuler Homes Inc 828 Fort St. Mail 4th 521-5661 Hono HI 96791		

### DRIVER'S OPINIONS

RANGE OF THIS VEHICLE AS COMPARED TO THE SAME TYPE OF VEHICLE FUELED WITH GASOLINE:

☐ MUCH WORSE ☐ SLIGHTLY WORSE ☒ ROUGHLY THE SAME ☐ SLIGHTLY BETTER ☐ MUCH BETTER

ACCELERATION OF THIS VEHICLE AS COMPARED TO THE SAME TYPE OF VEHICLE FUELED WITH GASOLINE:

☐ MUCH WORSE ☒ SLIGHTLY WORSE ☐ ROUGHLY THE SAME ☐ SLIGHTLY BETTER ☐ MUCH BETTER

BRAKING OF THIS VEHICLE AS COMPARED TO THE SAME TYPE OF VEHICLE FUELED WITH GASOLINE:

☐ MUCH WORSE ☐ SLIGHTLY WORSE ☒ ROUGHLY THE SAME ☐ SLIGHTLY BETTER ☐ MUCH BETTER

MANEUVERABILITY OF THIS VEHICLE AS COMPARED TO THE SAME TYPE OF VEHICLE FUELED WITH GASOLINE:

☐ MUCH WORSE ☐ SLIGHTLY WORSE ☒ ROUGHLY THE SAME ☐ SLIGHTLY BETTER ☐ MUCH BETTER

OVERALL HANDLING OF THIS VEHICLE AS COMPARED TO THE SAME TYPE OF VEHICLE FUELED WITH GASOLINE:

☐ MUCH WORSE ☐ SLIGHTLY WORSE ☒ ROUGHLY THE SAME ☐ SLIGHTLY BETTER ☐ MUCH BETTER

CARGO CAPACITY OF THIS VEHICLE AS COMPARED TO THE SAME TYPE OF VEHICLE FUELED WITH GASOLINE:

☐ MUCH WORSE ☒ SLIGHTLY WORSE ☐ ROUGHLY THE SAME ☐ SLIGHTLY BETTER ☐ MUCH BETTER

EASE OF OPERATION OF THIS VEHICLE AS COMPARED TO THE SAME TYPE OF VEHICLE FUELED WITH GASOLINE:

☐ MUCH WORSE ☐ SLIGHTLY WORSE ☒ ROUGHLY THE SAME ☐ SLIGHTLY BETTER ☐ MUCH BETTER

OVERALL OPINION OF THIS VEHICLE AS COMPARED TO THE SAME TYPE OF VEHICLE FUELED WITH GASOLINE:

☐ MUCH WORSE ☐ SLIGHTLY WORSE ☒ ROUGHLY THE SAME ☐ SLIGHTLY BETTER ☐ MUCH BETTER

WOULD YOU CONSIDER BUYING A VEHICLE OF THE SAME MAKE WITH THE SAME ENGINE AND FUEL SYSTEM?:

☒ YES

☐ NO

### DRIVER'S COMMENTS

(Good or Bad, we value your impression of this vehicle. Please give us your comments.)

I really enjoyed the fact of being friendly to  
the environment with the fuel choice. The propane had  
a hesitation at starting off. was all fixed  
performed well. The best part of my experience  
was the "PR" to raise the awareness of  
taking care of our planet. Thanks!